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Via Electronic Filing

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
Office of the Secretary
445 12th Street, SW
Washington, D.C. 20554

Re: Ex Parte Notice, Docket No. PS 06-229

Dear Ms. Dortch:

Pursuant to 47 C.F.R. § 1.1200, *et seq.*, Harris Corporation (Harris) hereby submits to the Federal Communications Commission (Commission) the following supplemental information in the above-captioned proceeding.

Respectfully submitted,

/s/

Patrick Sullivan
Government Relations
Harris Corporation

Shaping a Policy on Open Standards and Proprietary Technology:

Harris Corporation Input on Key Remaining Questions

I. How should the Commission shape a policy requiring non-proprietary technology and open standards in establishing requirements for the Public Safety Wireless Broadband Network (PSWBN)?

Vendors presumably want to be able to preserve their intellectual property, but often call for the FCC to ensure that all manufacturers conform to open standards. How do you have a viable business model under this regime? Where does the balance get struck? Are there baselines that can be flexible to accommodate future innovation?

Response:

The commercial telecommunication industry thrives on open standards; success in this market is impossible without them. Telecommunication Original Equipment Manufacturers (OEM's) have demonstrated a prolific capacity to develop intellectual property and to bring this intellectual property into standards-setting processes, thereby creating open standards. Ultimately, the value derived from their intellectual property is to openly cross-license this technology under fair and reasonable terms (FRAND), frequently without royalties, to create new and emerging markets that can bring scale to their businesses.

This vibrant eco-system should be the pattern for the PSWBN. The PSWBN is poised to leverage this model in that the Commission, exercising its jurisdictional authority through a consensus process, has already mandated LTE technology.

It is imperative for the PSWBN to track the continued evolution of the LTE standard. This will assure continued innovation by making sure Public Safety neither misses out on advances in commercial technology nor wonders off on its own and ends up in a proprietary dead end. Harris endorses the recommendations of the PSAC Network Evolution Work Group in its recent report to the Commission.

The following steps are needed to further this progress:

1) Public Safety must procure network infrastructure with scale – not through a patchwork of small networks. This does not necessarily imply a single network, but could be achieved by a network of networks, each of which has economies of scale realized through interchangeable network components.

2) Components of the PSWBN must be interchangeable across vendors – i.e. standardized LTE building blocks such as the RAN and components that comprise the Core (Home Subscriber Server (HSS), PDN Gateway (PDN-GW), S Gateway (S-GW), Mobility

Management Entity (MME), etc.) should be interchangeable. This is consistent with best commercial practices by wireless service providers today.

3) It is essential that standardized LTE building blocks are tested in accordance both with commercial operator IOT processes and ultimately an IOT process that may be unique to the PSWBN.

Recommendation: The Commission should mandate certificates of conformance for these LTE building blocks, with documented evidence of adherence to LTE standards in commercially deployed networks and associated IOT processes. In addition, vendors supplying complete LTE Cores should provide documentation of that core configuration meeting operation IOT in a live LTE network. Consistent with requirements already imposed on waiver recipients, this requirement should be reflected in their Interoperability Showing.

II. How Can a Uniform Architecture be Facilitated Through Guidance as Opposed to a Rigid Regulatory Structure?

Response:

The Commission has exercised its jurisdictional authority within the Third Report and Order by mandating LTE for the PSWBN. This order also mandates implementation of standard LTE functional subsystems and the interfaces between them. This created a solid regulatory framework that substantively creates an architectural baseline that supports nationwide interoperability.

It is important to recognize that LTE is an extremely comprehensive standard and, in typical commercial practice, commercial operators rarely implement all elements of the standard. Rather, they implement those elements that support their business case. The specification of their unique implementation is performed by definition of an Operating Profile. Their multi-sourced supply chains and IOT processes ensure compliance and conformance to their Operating Profile. Implementation of the PSWBN should follow a similar process. Definition of the Operating Profile for the PSWBN is likely beyond the jurisdictional authority of the Commission and hence subject to guidance only. Definition of the Operating Profile is a matter of operational policy, and therefore the Public Safety community should have flexibility to implement both national and locally defined Operating Profiles consistent with the future governance structure.

Harris recommends the following principles going forward:

1) The Commission should continue to provide guidance and subject to its jurisdictional authority and finalize a rulemaking on the topics of Interoperability, Network Evolution, Security & Authentication, and User Requirements and Applications. These rules and recommendations should be the subject matter of on-going activities within ERIC PSAC. In the near future, ERIC PSAC will also undertake work related to governance matters and further refine its recommendations to the Commission. Harris fully endorses this process and is providing technical input as a PSAC member.

2) Through ERIC PSAC, the Commission should provide guidance that assists in the definition of a system architecture, comprised of a nation-wide network, based on a single PLMN ID, and constructed from fully interoperable regional networks, implemented on interchangeable LTE building blocks.

III. What is the best PLMN ID Approach?

What is the best PLMN ID Regime? What is the response to claims that a "hybrid method" with a single centralized HSS provisioning core is impossible and that there is no standard for such a method?

Response:

A hybrid PLMN ID approach attempts to balance between the tradeoffs between two extremes. The challenge with the hybrid approach is that it is not a typical approach and may not be fully supported by existing standards. Below please find a comparison of attributes of a Single PLMN ID regime and that with Multiple PLMN IDs:

	Single PLMN ID	Multiple PLMN IDs
Architecture	The PSWBN is a single network built off a single redundant core.	The PSWBN is a network of regional networks. Each regional network is built off a single redundant core.
Interoperability	Nationwide	Nationwide and Regional
Mobility	Handover can occur nation-wide	Handover occurs within regional networks. UE's roam between regional networks, transparent to the user.
HSS	Requires implementation of a single nation-wide HSS.	Each regional network implements an HSS that is synchronized to a nationwide database.
Backbone	Requires more capacity between the major functional subsystems (MME, PDN-GW, S-GW, HSS, PCRF)	Regional cores provide aggregation points for the Data and Control Planes. This simplifies the backbone implementation.
Redundancy	Centralized architecture requires particular attention to eliminate single points of failure	Distributed architecture provides inherent redundancy and levels of availability that may not be achievable with a single core network.
Clearing house	Not required within the PSWBN. Facilitates interoperability with commercial networks	Facilitates implementation of inter-regional services and interoperability with commercial networks
Construction	Requires a systemic top-down implementation strategy.	Construction of regional networks can proceed in parallel. Interconnection of regional networks can be facilitated through a clearing house function.
Governance	Requires a single governance structure.	Each regional network can be implemented with a region-specific governance structure. Inter-region governance issues are limited in scope.
Operations & Maintenance	Requires a nationwide Network Operations Centers (NOCs) and O&M structure.	Each regional network implement independent NOCs & O&M structures.

Upon continued review of the record on this matter, including work performed recently within PSAC, and recognizing that both architectures have merit, Harris recommends:

1) The PSWBN should be implemented with a single PLMN ID.

2) A nationwide network comprised of multiple regional networks should be constructed, with spectrum licensed to a suitable governance entity that is responsible and accountable for ensuring the mandate for nation-wide interoperability is achieved.

3) The nationwide network should be implemented as a network of regional networks. The

Operating Profiles of these regional networks should be implemented in accordance with requirements specific to each region, consistent with over-arching parameters that ensure nationwide interoperability.

IV. What baseline requirements should be mandated by the FCC? How can we ensure standards are being followed, with particular regard to robustness and hardening?

Response:

The Commission must ensure that rule making outcomes are in accordance with its jurisdictional authority. Further, it is imperative for the Commission to remain a "Trusted Partner" with Public Safety to ensure our nation's first responders and public safety organizations get the nationwide interoperable broadband network they need. ERIC TAC and ERIC PSAC are two vehicles to continue to foster and develop this Trusted Partnership.

Harris believes the Public Safety community is best equipped to establish its requirements as it pertains to operational needs. The challenge lies in how to translate operational needs into technical requirements that can drive implementation. By itself, Public Safety does not have the expertise or resources to implement a nationwide LTE network. Partnerships are required:

1. **Governance Partnerships**: State/Local/Tribal/Federal. The Federal component of this partnership should include not only user groups such DHS and DOJ, but also those that can provide expertise on regulatory matters, and assistance with implementation and funding mechanisms. The latter is comprised of the Commission, the Department of Commerce and the non-operational components of DHS that were established to support Public Safety's interoperability objectives. This vision has already been articulated by the Commission in the National Broadband Plan.

2. **Industry Partnerships:** These partnerships will provide experience in designing and building mission critical networks, and supply competitive and innovative products, technologies and services.

As a general matter, Harris believes the Commission should only codify:

1) Technical requirements consistent with spectrum management.

2) Regulatory matters consistent with ensuring interoperability.

The Commission has many examples of successful practice of item 2 above. For narrowband spectrum designated for Public Safety use, in portions of the spectrum designated for interoperability (such as mutual aid channels), the Commission has rightfully mandated use of specifically named standards. Recent rule making such as the Third Report and Order mandating use of the LTE standard is another example of this. The Commission should avoid definition of specific operational or technical requirements on how these standards are actually implemented.

Under Item 2 there is a vast grey zone. There is virtually unanimous consent that the Commission exercised its jurisdictional authority appropriately and correctly by mandating use of 3GPP LTE for the PSWBN. There is also growing consensus among participants in the regulatory dialog to adopt and enforce rules relative to certain specific portions of 3GPP LTE standards. For example, on the basis of comments provided in the Fourth FNPRM proceedings on this matter, and acceptance of recommendations by PSAC of the Security and Authentication May 2011 Report, the Commission should mandate implementation of certain standardized security features of LTE as recommended by PSAC.

Absent this type of strong consent, the Commission must exercise caution not to pre-maturely codify technical requirements. The Commission must be positioned as a partner in the emerging governance structure and continue to codify those elements consistent with the recommendations of that governance structure, through appropriate rule making proceedings. So, while many recommendations offered in the Fourth FNPRM proceedings suggest that it is too early to implement specific rules that should not be interpreted to mean that they should not be implemented in the future – there simply is insufficient information to codify those elements today.

V. What core requirements for governance should the Commission establish? Recognizing that the network must yet be built out, should there be a baseline FCC governance structure to give certainty on how the pieces fit together in the meantime?

Response:

Governance involves:

1) On-going regulatory matters at the Commission. The Commission must continue to exercise its jurisdictional authority in accordance with Federal statutes, as noted in IV above

2) Federal Oversight. The Department of Commerce and the Department of Homeland Security will likely have oversight in certain matters of governance, in matters such as procurement/funding.

3) Public Safety Users. Public safety jurisdictions must have significant participation in the establishment process and operation of the governance structure.

4) Federal/Tribal user agencies. Representatives from Federal agencies that are granted access to the PSWBN (e.g., DOJ and DHS) and Tribal authorities should also participate in like manner.

5) Procurement oversight. Oversight of design, implementation, operation and maintenance

A governance structure must be responsible and accountable for the PSWBN throughout its

lifecycle. Many of those responsibilities lie well outside the jurisdictional authority of the Commission. Spectrum waivers have emphasized the vital need to comply with future regulatory requirements that the Commission may impose through future rule-making. In like manner, the Fourth FNPRM will not finalize all rules associated with the PSWBN, particularly in light of the fact that pending legislation before the 112th Congress may have a significant impact on this matter.

PSAC has conducted robust dialog on this topic and has placed this topic on its late summer agenda. The Commission should defer actions relative to governance until PSAC has an opportunity to deliberate this issue and a clearer Congressional outcome can be envisioned.

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